Norges teknisk–
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Institutt for matematiske fag

TMA4110 Matematikk 3 02.12.03

Fasit

Oppg 1

$z_0 = e^{\frac{\pi}{6}i}$
$z_1 = e^{\frac{2\pi}{3}i}$
$z_2 = e^{-\frac{5\pi}{6}i}$
$z_3 = e^{-\frac{\pi}{3}i}$

Oppg 2

a) $y(1) \approx 1.1394$

b) $y(x) = (x+1)e^{-x^2}$
$y(1) = 0.7358$

Oppg 3

a) $y = -5e^x + 3e^{2x} + 1 + e^{-x}$

b) $y = Ae^x + (B - \frac{x}{2})e^{-x}$

c) $y = (-\ln\cos x + A + Bx)e^x$

Oppg 4

a) $a \notin \{-1, 2\}$

b) $t = -4$

c) $\left\{ \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix} \right\}$ (f.eks)

Oppg 5

a) $V = \text{span}\left\{ \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix} \right\}$ $V^\perp = \text{Null}(A) = \text{span}\left\{ \begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix} \right\}$

b) $p = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$

Oppg 6

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = e^{2t} \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} + e^{4t} \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$$

Oppg 8

$x_1(t) = 100e^{-\frac{3}{100}t}$
$x_2(t) = 100(2e^{-\frac{2}{100}t} - e^{-\frac{3}{100}t})$